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effect 38 times greater than can be obtained by the consumption of the same fuel in the ordinary mode of chimney ventilation. Accordingly, he strongly advises the adoption of the former in preference to the latter: and inveighs against the stove-doctors of the present day, who, on pretence of economy and convenience, recommend the slow combustion of a large body of coke, by means of a slow circulation of air; under which circumstances, it is well known to chemists that much carbonic oxide, a gas highly pernicious to all who respire it, is generated; accompanied, at the same time, by a comparatively small evolution of heat. In order to obtain the maximum quantity of heat from a given mass of fuel, its combustion, he observes, should be very vivid, and the evolved caloric should be diffused over the largest possible surface of conducting materials; a principle which has been judiciously applied in several French factories. It has been proved that work-people employed in calico-drying rooms, heated according to the plan here reprobated, become wan, emaciated, and diseased; while in rooms in which the air is more highly heated by means of steam-pipes, they preserve their health and florid complexion.

16. "An Experimental Inquiry into the Relative Merits of Magnetic Electrical Machines and Voltaic Batteries, as Implements of Philosophical Research." By William Sturgeon, Esq., Lecturer on Natural and Experimental Philosophy at the Honourable East India Company's Military Academy at Addiscombe. Communicated by P. M. Roget, M.D., Sec. R.S.

The first part of this paper is occupied by a description of two forms of constructing the magnetic electrical machine, which the author has adopted; and the second, with the particulars of some experiments made with a view to determine the respective powers of these machines as compared with the common voltaic battery. In the first form of the instrument, a reel, round the periphery of which 200 feet of copper wire, one 20th of an inch in diameter and covered with stout sewing-silk, are coiled, is made to revolve on a spindle, placed in the axis of a system of horse-shoe magnets, so as to remain within the branches of the latter during its whole revolution. The electric currents produced in the copper wire by magnetic induction, while the coil is moved at right angles to the plane of the magnets, are conducted by means of four semicircular metallic flanges attached to the spindle, into cisterns of mercury, the one being positive, and the other negative; and which consequently act as the two poles of the battery. In the second form of the apparatus, a piece of soft iron, of which the ends are bent into the shape of two arms, and which is surrounded with a coil of 300 feet of copper wire, is made to revolve in front of the poles of a horse-shoe magnet; its axis of motion coinciding with that of the magnet; and the electrical currents determined in the wire by this rotation, being collected in the same manner as in the former instrument.

The author next details several series of experiments which he made for the purpose of ascertaining the relation observable be-

tween different velocities of rotation in these instruments and the corresponding effects : first, with regard to the deflection of a magnetic galvanometer ; secondly, with regard to chemical decompositions ; thirdly, with regard to the production of sparks ; and lastly, with regard to the intensity of the shock communicated to the human body. He compares the effects produced by the magnetic electrical battery, first, when the coil consisted of one continuous length of wire ; secondly, when the coil was doubled upon itself so as to constitute two sets of conductors of half the length of the former ; thirdly, when, upon being again doubled, it composed four conductors of one quarter of the length of the first ; and lastly, when, on being doubled a third time, the electric current was made to pass through eight wires, each one eighth of the original length of the single wire. It was found that by thus multiplying the channels of conduction, although both the magnetic and the luminous effects continue to be produced with scarcely any sensible difference of intensity, the power of effecting chemical decompositions becomes more and more impaired, and the physiological influence is weakened in a still more remarkable degree. In the four-stranded coil, indeed, no shock whatever could be produced, however rapidly the instrument was made to revolve. The author endeavours to account for these variations of effect by the diminution of velocity in the electric current, its quantity remaining unaltered, consequent on its division into several streams by the multiplied channels offered to its progress. He also tried the effects of conjoining the magnetic electrical machine with ordinary voltaic combinations ; sometimes acting in cooperation, and at other times in opposition to one another ; and notices the corresponding results, which were sufficiently accordant with theory.

17. "Welt Mechanik." By M. Kropalschek.

The object which the author has in view, in this paper, is to overturn the theory of universal gravitation, as regulating the planetary motions. The memoir is divided into two parts ; in the first, he disputes the accuracy of Kepler's law respecting the description of equal areas in equal times, and endeavours to confute the fundamental doctrines of astronomy relating to the elliptical orbit of the earth, the difference between solar and mean time, and the whole theory of the motions of the moon and the planets. In the second part, the author enters into a detailed exposition of his own views of the mechanism of the heavens ; and devotes 215 closely written pages to the development of a perfectly new hypothesis, which he advances, founded on a supposed variation of the progressive motion of the planets, in an orbit perfectly circular, and by which he thinks he can explain all the phenomena they present to observation.

18. "Plan et Esai d'un nouveau Catalogue Sidéral, avec une représentation graphique, et une loi de simple et régulière distribution des étoiles autour du Pole, qui pourra fournir plusieurs avantages à